Physics Lit
Factor

CONTENTS

JANUARY, 1938

Use of Microfilm in Documentation . . . . . WATSON DAVIS 1
Physical Interpretation of the Weather . . . . . EDGAR WOOLARD 5
Acoustic Vibrations and Internal Combustion Engine Performance. I. Standing Waves in the Intake Pipe System . . . PHILIP M. MORSE, R. H. BODEN AND HARRY SCHECTER 16
Daniel Guggenheim Airship Institute . . . . . TH. TROLLER 24
True Stress Strain Curves for Polycrystalline Material . . . . . R. K. HASKELL 30
Hydrodynamic Analogy for Shearing Stress Distribution in Bending . . . . M. A. BIOT 39
Compressibility and Velocity of Pressure Waves in Petroleum Oils . . ROBERT MATTESON 44
Working Stresses for the Rational Design of Concrete Structures . . . . JOSEPH MARIN 49
On Convection Currents in High Pressure Mercury Arcs . . . . . CARL KENTY 53

Here and There 34
Contributors to this Issue 36
Among the New Books 37
Current Literature of Physics

FEBRUARY, 1938

Applications of Physics in Biology . . . . . H. A. B. 67
Some Physical Properties of Protoplasm . . . . . E. NEWTON HARVEY 68
Diffusion Processes in Living Systems . . . . . M. H. JACOBS 81
Electrical Signs of Biological Activity . . . . . HERBERT S. GASSER 88
Potential Energies of Biologically Important Oxidation-Reduction Systems . . . . . WILLIAM MANSFIELD CLARK 97
Optical Studies of the Molecular Organization of Living Systems . . FRANCIS O. SCHMITT 109
Experimental Analysis of Rein's Thermostromuhr for Small Flows . . . . . J. F. HERRICK, EDWARD J. BALDES AND F. P. SEDGWICK 124
Condensation and Adsorption of Mercury Vapor . . . . . R. C. MASON 131
Photographic Study of Lightning . . . R. E. HOLZER, E. J. WORKMAN AND L. B. SNODDY 134

Here and There 118
Innovations in Instruments 120
Some of the New Books 122
Among Our Contributors 123
Current Literature of Physics

MARCH, 1938

Relation of Physics to the Biological Sciences . . . . . DETLEV W. BRONK 139
Electron Diffraction Methods of Studying Organic Films . . . . . L. H. GERMER 143
Biophysics and Biochemistry of Viruses . . . . . W. M. STANLEY 148
Photochemical Basis of Vision . . . . . SELIG HECHT 156
Mechanics of Muscular Contraction in Man . . . . . W. O. FENN 165
Some Aspects of Nuclear Physics of Possible Interest in Biological Work . . L. A. DUBRIDGE 178
Quantitative Measurements of Texture by the Magnetic Torque Method . L. P. TARASOV 192
Invariant Form of the Maxwell-Lorentz Equations for Accelerated Systems . GABRIEL KRON 196
Time Constants of Incandescent Lamps . . . . . W. E. FORSYTHE, M. A. EASLEY AND D. D. HINMAN 209

Here and There 187
Innovations in Instruments 188
Some of the New Books 189
Contributors to this Issue 191
Current Literature of Physics

April, 1938

Polarized Light Enters the World of Everyday Life . . . . . Martin Grabau 215
Frederic Eugene Ives . . . . . Edward Epstean and J. A. Tennant 226
X-Rays in Agriculture . . . . . Louis R. Maxwell and Sterling B. Hendricks 237
Order and Disorder in Alloys . . . . . H. A. Bethe 244
Reaction Rate Theory of Viscosity and Some of Its Applications . . Raymond H. Ewell 252
Reflection of Plane Wave Pulses from Plane Parallel Plates . . . . . Morris Muskat 275
Effect of Pressure Upon the Elastic Parameters of Isotropic Solids, According to Murnaghan's Theory of Finite Strain . . . . . Francis Birch 279

Here and There 270
Innovations in Instruments 271
Some of the New Books 272
Among Our Authors 274
Current Literature of Physics

May, 1938

"Palace of Discovery" at the Paris Exposition of 1937 . . . . . Jesse W. M. DuMond 289
Reviews of Recent Research 295
Recent Progress in Supersonics . . . . . William T. Richards 298
Study of Extreme Pressures and their Importance in the Investigation of Engineering Problems . . . . . Thomas C. Poulter 307
Application of the Lagrangian Equations to Electrical Circuits . . . . . D. A. Wells 312
Contribution to the Problem of Arcback in High Voltage Discharge Devices . . . . . H. Klemperer 326
Effect of High Energy Electron Random Motion Upon the Shape of the Magnetron Cut-Off Curve . . . . . E. G. Linder 331
Numerical Solution of Laplace's Equation . . . . . G. H. Shortley and R. Weller 334

Here and There 321
Innovations in Instruments 323
Some of the New Books 324
Contributors to this Issue 325
Current Literature of Physics

June, 1938

Applications of Physics in the Automotive Industry . . . . . The Editor 349
Physics and the Automotive Industry . . . . . F. K. Richtmyer 350
Resumés of Recent Research 352
Contribution of the Physicist to Highway Illumination . . . . . Clifton G. Found 354
Studying Engine Combustion by Physical Methods . . . . . Lloyd Withrow and Gerald M. Rassweiler 362
Mobility Method of Computing the Vibration of Linear Mechanical and Acoustical Systems: Mechanical-Electrical Analogies . . . . . F. A. Firestone 373
Studies in Lubrication. I. The Theory of the Thick Film Lubrication of a Complete Journal Bearing of Finite Length . . . . . M. Muskat and F. Morgan 393
Film Lubrication of Finite Curved Surfaces . . . . . Selby M. Skinner 409
Dynamic Characteristics of Glow Discharge Tubes . . . . . Herbert J. Reich and Wallace A. Depp 421

Here and There 388
Among Our Authors 390
Some of the New Books 392
Current Literature of Physics

JULY, 1938

Scientific Training and Its Relation to Industrial Problems . . . . . C. F. KETTERING 427
Resumés of Recent Research 431
Human Beings and the Motor Car . . . . . CARL BREER 433
Physics of Rubber as Related to the Automobile . . . . . W. F. BUSSE 438
Some Physical Problems in Noise Measurement . . . . . PAUL HUBER 452
Photoelastic Analysis Practically Applied to Design Problems . . . . . O. J. HORGER 457
Operating Characteristics of Power Tubes . . . . . E. L. CHAFFEE 471
Cathode Spot Fixation and Mercury Pool Temperatures in an Ignitron . . . . . J. SLEPIAN AND A. H. TOEPFER 483
Note on Certain Guided Waves in Slightly Noncircular Tubes . . . . S. A. SCHELKUNOFF 484

Here and There 465
Innovations in Instruments 467
Some of the New Books 469
Among Our Authors 470
Current Literature of Physics

AUGUST, 1938

Some Physical Phenomena at the Temperature of Liquid Helium . . . . E. F. BURTON 489
Resumés of Recent Research 500
Rigidity of Settled Pigment Layers in Paints . . . . E. L. MCMILLEN AND D. W. GLASER 502
Simple Electron Microscopes . . . . . R. P. JOHNSON 508
Reflections on Rupture . . . . . P. W. BRIDGMAN 517
Reflection Coefficient of Mercury . . . . . R. C. MASON 535
Studies in Lubrication. II. Experimental Friction Coefficients for Thick Film Lubrication of Complete Journal Bearings . . . . . F. MORGAN AND M. MUSKAT 539
X-Ray Investigation of the Form of the Acetylsalicylic Acid in Certain Sugars . S. S. SIDHU 546

Here and There 529
Among Our Authors 530
Some of the New Books 531
Innovations in Instruments . . . . . 533, ii
Recent Booklets on Instruments and Materials xvii
Current Literature of Physics

SEPTEMBER, 1938

Atom Tracks Exhibition at the Science Museum, London 551
Biological Effects of Low Velocity Cathode Rays . . . . . CARYL P. HASKINS 553
Research Foundation of Armour Institute of Technology . . . . . HAROLD VAGTBORG 562
Resumés of Recent Research 564
Further Notes on the Physics of Subsidence and Ground Movement in Mines . . . . . H. P. GREENWALD 567
Physics in Pharmacy . . . . . RONALD L. MCFARLAN 573
Electromagnetic Waves in Elliptic Hollow Pipes of Metal . . . . . LAN JEN CHU 583
Method of Measuring Luminescent Screen Potential . . . . . HERBERT NELSON 592
Characteristics of the Glow to Arc Transition in Mercury Vapor . . . . . FREDERICK A. MAXFIELD AND GORDON L. FREDENDALL 600

Here and There 578
Contributors to this Issue 580
Some of the New Books 581
Innovations in Instruments ii
Current Literature of Physics

OCTOBER, 1938

Fundamental Research in Industry . . . . . THE EDITOR 611
Filtration of Sound, I . . . . . R. B. LINDSAY 612
Metallurgical Applications of Electron Diffraction . . . . . H. R. NELSON 623
Time Lag in Gas-Filled Photoelectric Cells . . . . . A. M. SKELLETT 631
Currents to Conductors Induced by a Moving Point Charge . . . . . W. SHOCKLEY 635
On the Electrographic Recording of Fast Electrical Phenomena . . . . . P. SELENYI 637
Plastic Deformation of Lead, Copper and Aluminum Under Static Compression . . . . . W. JAMES LYONS 641
Drift of Magnetic Permeability at Low Inductions after Demagnetization . . . . . G. R. PATTERSON 646
Type of Electrical Resonator . . . . . W. W. HANSEN 654
Electrical Conduction in Quartz, Periclase, and Corundum at Low Field Strength . . . . . E. G. ROCHOW 664
Effect of Pressure on the Viscosity of Boric Anhydride Glass . . . . . ERNEST B. DANE, JR. AND FRANCIS BIRCH 669

Here and There 628
Contributors to this Issue 629
Innovations in Instruments ii
Current Literature of Physics

NOVEMBER, 1938

Nuclear Physics and Scientific Journalism . . . . . THE EDITOR 675
Production of High Energy Particles . . . . . W. H. WELLS 677
Resumés of Recent Research 689
Present-day Design and Technique of the Cyclotron . . . . . FRANZ N. D. KURIE 691
On the Starting of Hg Vapor Discharge Tubes . . . . . CARL KENTY 705
Stresses in a Heavy Disk Suspended from an Eccentric Peg . . . RAYMOND D. MINDLIN 714
Vitrification and Crystallization of Organic Cells at Low Temperatures . . . . . ALEXANDER GOETZ AND S. SCOTT GOETZ 718
Role of Solid Friction in Synthetic Dielectrics . . . . . ANDREW GEMANT 730
Motion of Powder Gas, An Apology . . . . . R. H. KENT 734

Here and There 702
Contributors to this Issue 704
Innovations in Instruments ii
Booklets on Instruments xv
Current Literature of Physics

DECEMBER, 1938

Penetration of Oil Sprays . . . . . P. H. SCHWEITZER 735
Resumés of Recent Research 742
Evidence for the Existence of a New Elementary Particle . . . . . ENOS E. WITMER AND MARTIN A. POMERANTZ 746
Professor Arnold Sommerfeld 754
Evaluation of Yield Value with the Sphere Viscometer . . . . . JOHN C. WILLIAMS AND ELLIS I. FULMER 760
Clean-Up and Pressure Effects in Low Pressure Mercury Vapor Discharges: A Reversible Electrical Clean-Up of Mercury . . . . . CARL KENTY 765
Geiger Counter for Beta-Rays . . . . . A. KEITH BREWER AND A. BRAMLEY 778
On the Symmetry of the Benzene Ring . . . . . LENNART SIMONS 781

Author Index 786
Subject Index 789
Volume Table of Contents I
Here and There 755
Some of the New Books 756
Among Our Authors 759
Innovations in Instruments ii
Current Literature of Physics